Quality of Life in older Australians after Hip Fracture: a longitudinal study (QoLAHF) – Project Description

Introduction

Background/Rationale

Osteoporosis remains one of the most common illnesses affecting adults in the later stages of life and can incur a significant degree of morbidity if left untreated. The most recent data on the prevalence of osteoporosis is 8.9% for all Australians over 45 years old.[1] The true prevalence of this silent disease is likely much greater, as diagnoses of osteoporosis tend to be made only after a fracture.[2] Among these fragility fractures, hip fracture is the most common at 31.7% compared to other sites, including forearm (12.6%), lumbar spine and pelvis (13.2%), lower leg and ankle (11.1%) and shoulder and upper arm (11.0%)[1]. Additionally, hip fracture is by far the costliest on the healthcare system, with an estimated total cost of $1,126,808,578 in 2022 (AUD 2012), representing 43% of the price of all fractures in Australia.[3]

Hip fractures are often a life-altering event and can result in significant morbidity and mortality, frequently making once independent patients now dependent on others for care. This study aims to establish baseline health-related quality of life (HRQoL) levels for up to one year in older adults following a fragility hip fracture. This data will aim to improve the understanding of disease burden in this group of patients and guide future policies and research. It may also serve as a useful reference dataset for further analyses of HRQoL in Australia and worldwide.

Literature Review

There have been many studies over the last 20 years assessing quality of life following various types of fragility fractures. The most frequently evaluated of these is hip fractures, primarily likely given the significant morbidity associated with this type and the norm for these patients to be hospitalised post-fracture.

ICUROS

The most extensive study of recent is the International Costs and Utilities Related to Osteoporotic Fractures Study (ICUROS), a prospective multi-centre international study initiated in 2007 through the International Osteoporosis Foundation with the objective of estimating costs and quality of life related to osteoporotic fractures.[4] The Australian arm of the ICUROS (AusICUROS) was recently published in 2021 and aimed to assess the relationship between HRQoL 12 months post-fracture and 5-year mortality.[5] Within the AusICUROS, HRQoL was measured using the older EQ-5D-3L and included data on 524 adults with fragility fractures across

Australia, 150 of whom had hip fractures. The AusICUROS concluded that "mortality risk was lower in participants who recovered to their pre-fracture HRQoL at 12 months compared to those who did not recover (HR = 0.56, 95% CI: 0.33–0.96, p = 0.034)".[5] Of particular importance to the QoLAHF study, the majority (59.3%) of hip fracture patients did not recover to pre-morbid HRQoL.[5] In addition, hip fracture was associated with a hazard ratio of 4.28 (2.37–7.72) with respect to 5-year mortality.[5]

The AusICUROS, although not restricted to hip fractures, was the only large Australian study identified assessing change in HRQoL following hip fracture.[5] The QoLAHF study aims to expand on this limited Australia data on HRQoL following hip fracture by evaluating a prospective dataset and utilising an updated HRQoL tool as outlined below.

Instruments

The EuroQol Group EQ-5D was observed to be the most commonly used QoL questionnaire for previous hip or fragility fracture studies, included in 9 prospective and 1 retrospective study.[5–14] However, of these, all utilised the previous 3L (3-Level) variant rather than the updated 5L (5-Level) variant of the questionnaire.[5–14]

The 36-Item Short Form Health Survey (SF-36) was the next most common questionnaire assessing HRQoL and is widely accepted as a generic quality of life questionnaire.[10,15–17] Both the SF-36 and EQ-5D have shown high responsiveness in their ability to assess clinically important changes in HRQoL in elderly patients with hip fractures.[18] However, the EuroQol scale is generally the preferred item in geriatric patients, particularly due to its brevity and simplicity.[17,19] Additionally, despite the increased sensitivity of the SF-36 to lower levels of morbidity, the EQ-5D scale is still applicable when health changes are expected to be substantial, as would be the case post hip fracture.[19]

Other lesser utilised instruments assessing HRQoL following fragility fractures included the generic 15D and Short Form (SF-6D) questionnaires[20], the WHOQOL-BREF questionnaire[21], and the Health Utility Index (HUI-2) questionnaire[22].

Prior studies have also assessed functional capacity surrounding hip fracture in addition to HRQoL. Among those studies outlined above, four tools were observed: Katz Index of Independence in ADLs[10], the Barthel Index (ADLs)[6,9], Harris Hip Score (function post total hip arthroplasty)[6], and Rapid Disability Rating Scale version 2 (RDRS-2)[17]. The Barthel Index[23] and Katz Index[24] are of particular interest as generic ADL scores and have been shown to be effective predictors when used with geriatric hip fracture patients[25]. The Katz index evaluates individuals across six domains of ADLs, with each domain being rated as "independent" or "dependent", representing a 1 or a 0, with a total score between 0 (total dependence) and 6 (complete independence). The Barthel Index differs in that it instead divides ADLs into ten domains and scores patients in 5-point increments, intending to score a patient between 0 (total dependence) to 100 (complete independence). While both scores evaluate the level of independence in various domains of ADLs, the Katz Index has advantages in its brevity and simplicity, but the Barthel Index, by contrast, has greater discriminatory power, particularly in the mobility portion of ADLs, which in hip fracture patients would be of particular interest.

The Charlson Comorbidity Index[26] (10-year mortality) was frequently utilised in studies assessing HRQoL post hip fracture.[6,9,14] Although not addressing change in QoL surrounding hip fracture, it is a valid and commonly utilised assessment of mortality risk in hospitalised patients.

Study Population Size

Of the 11 prospective studies already mentioned assessing QoL post hip fracture, study population sizes varied from 70 patients at the lowest, and 487 at the most, with a median study population size of 179 and a mean of 205.[5–13,17,21] This excludes non-prospective studies such as a retrospective population study assessing HUI-2[22] and a study comparing outcomes of surgical technique[14], a cross-sectional assessment of SF-36 in osteoporotic women[15], and also excludes a small case-control comparing 15D and SF-6D performance fragility fractures[20].

Follow-up Timepoints

In addition to the admission/baseline assessment, prospective studies assessing HRQoL post hip fracture generally had follow-up at 12 months and another follow-up timepoint in between, either at 4 months post fracture[5,6,12,13] or at 6 months post fracture[10,21]. Two studies were identified extending the follow-up timeframe: to 18 months as with the ICUROS studies[5], and 24 months as done by Ekström et al.[12]

Alternative follow-up time points surrounding included: only at 12 months post fracture[17], on admission and at discharge post surgical management[9], and at 1- and 6-month marks with being patients asked to recall 3 month QoL at the 6-month follow-up.[8] Longer time points were observed, including at 1 year and 5 years[11], and a 4-5 year retrospective assessment of HRQoL before fracture, at 1 month and 1 year post fracture[7].

Mitigating Effects of Cognitive Impairment

The major potential source of error in this study would be cognitive impairment. This is particularly important when recall of pre-fracture HRQoL is essential to establishing a baseline from which the subsequent effect of a hip fracture on an individual's quality of life can be determined.

Using the Mini-Mental State Examination (MMSE), individuals can be graded according to cognitive dysfunction severity. A study by Avci et al. utilised the following divisions: 25-30 cognitively intact, 20-24 mild dysfunction, 10-19 moderate dysfunction, and 0-9 severe dysfunction.[14] Another study by Buecking et al. used similar but alternate divisions: 27-30 no impairment, 20-26 mild, 11-19 moderate and 0-10 severe impairment.[9]

One potential solution to this utilised in some studies includes facilitating a proxy to complete or assist completion of the HRQoL instrument on behalf of the patient in cases of cognitive impairment.[6,10] However, this may create some inconsistency in the dataset, given that some patients will have HRQoL scores self-expressed, whereas other patients may have scores determined by the observation of another individual. Recognising this, studies elected to either exclude patients with cognitive impairment[5,13,17] or include them but identify this subset accordingly in the results[9,21].

Other studies make no mention of the impacts of cognitive impairment on results obtained.[7,8]

It should be noted that the Mini-Mental State Examination (MMSE), whilst commonly utilised for diagnosing dementia and cognitive impairment, on meta-analysis has limited utility as a standalone test, particularly when assessing mild cognitive impairment.[27,28] In practice, it is recommended that if utilised, a lower cut point of 17 instead of the traditional point of 24 would have higher specificity to indicate normal cognition, albeit with a slightly lower sensitivity.[27] This is consistent with a comprehensive review of cut-off scores by Tombaugh et al., defining severe cognitive impairment as an MMSE score between 0-17.[29]

Also, note that some studies utilised different tools to assess cognitive impairment, including the RDRS-2 (incorporated into functional capacity assessment)[17], and the Short Portable Mental Status Questionnaire (SPMSQ)[21].

Objectives

The primary aim is to establish baseline and change quality of life (QoL) levels for up to one year in older adults who present to Eastern Health with a fragility hip fracture (HF).

Secondary aims are:

1) to validate ACS NSQIP risk calculator in older Australians after hip fracture surgery;
2) assess the correlation of MMSE score to post-operative outcomes and HRQoL
3) evaluate the relevance of intraoperative/postoperative data relating to renal function, intraoperative hypotension, and postoperative S. troponin

Methods

The STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines will be followed during the preparation of this manuscript. [30]

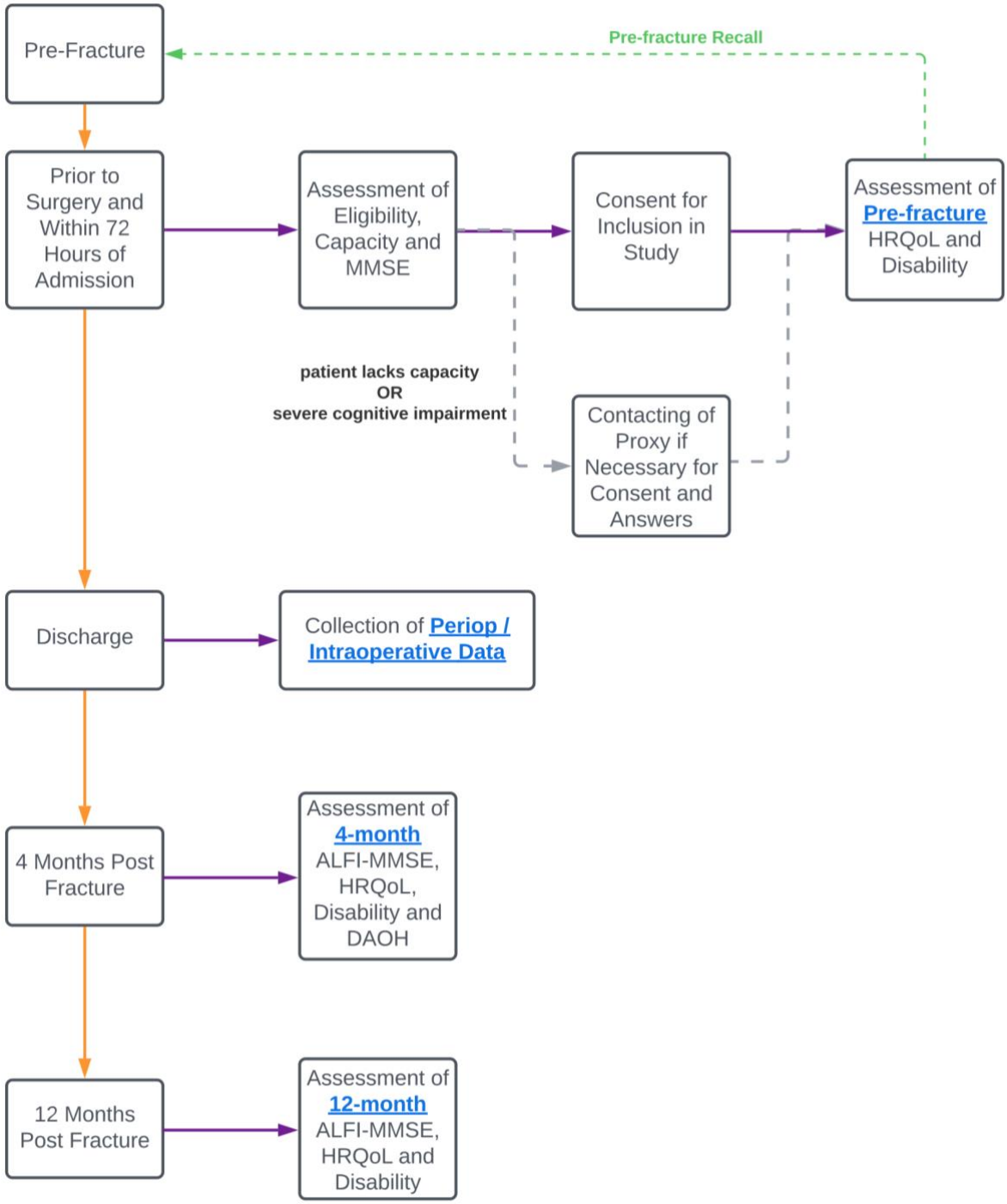
Study Design and Recruitment

This study will be a prospective observational cohort study. Patients will be identified after presenting with a hip fracture and be assessed for eligibility by one of the team members. Patient recruitment will occur at Box Hill Hospital or Maroondah Hospital, depending on where the patient presents or is transferred to at the time of review.

Table 1. Proposed data points and timepoints for collection

Data Points	Admission	4 months	12 months
EQ-5D-5L	X	X	X
Barthel Index	X	X	X
DAOH	X	X	
MMSE	X		
ALFI-MMSE		X	X
ACS NSQIP data	X		
Perioperative Data/Outcomes	X		

Figure 1. Data Collection Methods



Participants

Eligibility criteria includes patients aged 65 years or older who present to Eastern Health for low-trauma hip fracture, including both operative and non-operative patients. Potential participants will be evaluated within 72 hours after admission and prior to surgery.

The exclusion criteria include high-energy trauma, pathological fracture, patients receiving palliative care, a history of previous hip fracture on the same side, periprosthetic fractures, patients having not decided on participation prior to surgery or after 72 hours from the time of admission, patients and proxy respondents being unable or unwilling to give valid consent, including visual, hearing, mental incompetence and non-English speaking patients or proxy respondents. Patients who die or sustain a second fracture during the follow-up period will also need to be excluded from HRQoL and functional capacity analysis.

Capacity assessment will take place at time of recruitment, and those deemed to lack capacity will require a proxy to be contacted for consent and enrolment into the study and subsequent completion of the questionnaire. Additionally, patients unable to complete the questionnaire will require a proxy. Where this is done, it must be documented to allow for the completion of follow-up questionnaires by the same proxy and allow for analysis accordingly once all data has been collected.

Criteria for contacting proxy:

- history of significant cognitive impairment
- inability to understand, retain, and communicate back information about the nature of the project
- inability to answer the questionnaire in full
- MMSE score <18 [27,29]

Patient Recruitment

Eligible patients will be approached by a research team member or member of the anaesthetic staff, and the study will be explained to the patient. Should the patient lack capacity to consent to participation in the study, or should a patient fulfil any of the above criteria, the data collector will additionally contact a proxy. The data collector will answer any questions regarding the study at that time. Participant information and consent form, and more information upon request, will be provided to the patient. Up to 72 hours (from admission) or up until the time of surgery will be given for the patients to consider participation or not. If the consent form has not been received after these time points, the researcher will contact the patient/proxy to determine their decision on whether or not to participate. Participation is voluntary. Should the patient or proxy wish to withdraw consent to involvement at any stage, they may contact a senior research team member via contact details provided in the information sheet on the first assessment.

Data sources/measurement

Quality of life will be assessed using the EQ-5D-5L questionnaire. Functional capacity will be evaluated using the Barthel Index. Preinjury HRQoL and disability will be assessed at the time of or soon after receiving the consent. Since it is impossible to prospectively collect information prior to the fracture, preinjury recall is often used as an alternative method of HRQoL assessment studies of these patients. However, we believe that the recall in our study will be relatively accurate by limiting the recall period to 72 hours from admission.

The participant will then be followed up at 4 and 12 months (±14 days) by telephone interview. During the telephone interview, the researcher will administer the telephone version of the questionnaires (which will be given to the participant to keep at the time of initial assessment and to refer to during the follow-up assessments). Three attempts at contact will be made for each timepoint, after which the nominated next of kin will be contacted once. This will help establish whether the patient is still consenting to participate in the research project, whether the patient has died, or whether the participant has truly been lost to follow-up.

Data on patient demographics, comorbidities, laboratory values, procedures and inpatient events will also be collected.

Variables

For the main QoLAHF study, three main variables will be collected relating to:

1) subjective assessment of HRQoL through **EQ-5D-5L** (Appendix 1)
2) objective assessment of disability in ADLs through the **Barthel Index** (Appendix 2)
3) numeric evaluation of post-operative recovery, complications and mortality through **DAOH**

This study also aims to collect data on other secondary endpoints relating to:

- Correlation of **MMSE** (Appendix 3) to post-operative outcomes and HRQoL
- Validation of the **ACS NSQIP Surgical Risk Calculator** in an Australian population (Appendix 4)
    - data on preoperative comorbidities, postoperative complications, 30-day mortality, length of stay (LOS), return to theatre, readmissions, discharge to a new nursing home
- Evaluation of **intraoperative/perioperative data** relating to:
    - Renal function (creatinine, eGFR, RRT)
    - Intraoperative hypotension (pre-op MAP and ACEi/ARB use, intraop BP and vasopressors, periop Hb and fluid management up to 7 days postop, post-op mortality, AKI, MINS, delirium/POCD, stroke, MET calls)
    - Postoperative troponin

EQ-5D-5L

To measure patient-perceived Health-Related Quality of Life, the EuroQoL Group developed 5-level EQ-5D (EQ-5D-5L) health status measure will be used. It is a generic instrument for describing and valuing health in 5 dimensions (Mobility, Self- Care, Usual Activities, Pain/Discomfort, and Anxiety/ Depression) across 5 levels (no problems, slight problems, moderate problems, severe problems, and unable to/extreme problems). In addition, the EQ-5D includes a visual analogue scale (EQ-VAS) where patients are asked to rate their own health "today" on a 20cm vertical scale of 0 (worst imaginable health) to 100 (best imaginable health). The instrument has been widely used and tested across the globe and across patient groups as a valid and reliable measure of HRQoL. The instrument was recently updated to reduce the previous 3-level instruments ceiling effect, increase reliability, sensitivity, and ability to discriminate between different levels of health [31,32]. In addition, the most severe label for the mobility dimension was changed from "confined to bed" to "unable to walk about", enhancing its applicability and increasing the sensitivity for mobility which is particularly important when referring to post hip fracture HRQoL.

Australian population data has recently become available. Over time, it is suggested that the "5L version will replace the 3L version as the instrument of choice in future health economic evaluations and population-wide studies."[33] The QoLAHF study will not only provide an assessment of the impacts on HRQoL with hip fractures, but will also serve as a large baseline population reference for further studies assessing EQ-5D-5L in Australia and worldwide.

Barthel Index

The Barthel Index is a simple measure of functional independence and the ability of a patient to care for themselves and is scored in 10 domains of ADLs (e.g. feeding, toileting, grooming, mobility etc.).[23] Initially used in hospital settings and intended for nursing care of patients with neuromuscular or musculoskeletal disorders, and it is now frequently utilised as a generic score of ADLs to assess baseline function and to evaluate improvement with rehabilitation.[23,25,34]

The Barthel Index has been shown to correlate with other instruments measuring function, including the Katz Index.[34] But unlike the Katz Index, it does not have the associated significant floor effect and has greater discriminatory power, particularly in the motor domains of the instrument.[34] It has been validated in the use of orthogeriatric patients as a good tool to assess pre-fracture physical condition and track recovery following hip fracture, and also has good predictive value for the presence of comorbidities and complications.[25,35]

Despite this, given the similarity between Barthel Index and Katz Index, data collected to answer the Barthel Index can foreseeably be converted into an equivalent Katz Index score given the latter's binary distribution of "independent" vs "dependent" ratings.

Note that in the QoLAHF study, the prompt of "50 metres" will be used instead of "50 yards" due to the much greater familiarity of the former in the Australian population, and rough equivalence in distance of both measures.

DAOH

Days alive and out of hospital (DAOH) has been validated as a pragmatic, readily obtainable and generic patient-centred outcome measure for perioperative clinical trials.[36–38] It can be measured at time points 30, 90, and 180 days, and is calculated by subtracting the timepoint in concern with days spent in hospital, including any readmissions. If an individual dies within the timeframe, the score is zero. Although not a direct assessment of complications, by incorporating length of stay, readmissions, discharge destination and early deaths after surgery into a single outcome metric, it is highly sensitive to changes in surgical risk and the impact of complications.[36,37] Initially developed as a patient-centred outcome measure in cardiovascular research[39], its use has been expanded across several different perioperative settings and has been demonstrated in the setting of hip and knee arthroplasty.[40]

MMSE

An MMSE screening test will be utilised on patient recruitment during the first encounter. This will screen for pre-existing cognitive dysfunction and allow subgroup analysis post-data collection to evaluate the correlation between patient recovery in QoL and ADLs with the degree of cognitive impairment.

As per the reviews by Creavin et al.[27] and Tombaugh et al.[29], a lower MMSE cut-off score of less than 18 will be utilised to exclude patients with severe cognitive impairment from responding to the quality of life questionnaire. In this situation, a proxy will be contacted to consent to participation in the study and for responses to questions. In regards to moderate cognitive impairment, the EQ-5D has been shown to be effective in assessments of subjective HRQoL in elderly patients due to its brevity and simplicity[18].

On follow-up telephone reviews, a telephone version of the MMSE (the ALFI-MMSE) will be utilised that has a high correlation with the standard Folstein MMSE, as was outlined by Roccaforte et al.[41] This version draws all questions from the standard MMSE, but excludes questions 2e, 7, and 9-12 that rely on in-person interviews, and utilises only one object naming question, asking the individual to name the phone in their hand. This will be sufficient to screen for the development of severe cognitive impairment in-between the first assessment while an inpatient and subsequent telephone reviews.

Bias

Recall bias will be a significant but unavoidable source of bias when assessing pre-fracture HRQoL, as noted in Lingard et al.[42] hence the need to restrict recall of pre-fracture HRQoL within 72 hours of presentation. There will also be some unreliable accounts of pre-fracture QoL with cognitive impairment and those requiring a proxy in the case of severe cognitive impairment. However, MMSE data will be collected on all patients so that questionnaire results can be analysed in the context of the degree of cognitive dysfunction/use of a proxy.

Patients will also need to be excluded from the study as per the above circumstances, introducing sample bias. Non-response bias will also likely need to be accounted for during follow-up of patients. Survivor bias will exist where patients that had died or sustained a second fracture will be excluded from the analysis of HRQoL and disability. However, these patients may also be captured using the DAOH on subsequent analysis.

Lastly, there will be unrecognised confounding, as is the case with observational studies. In this study, there will be no attempt for matching or use of a control group.

Study Size

A 6/12-month interim analysis will be performed to calculate sample size. Our goal is to detect a medium effect size (or a clinically meaningful effect) with 80% or above power at 5% statistical significance.

We estimate that within a six-month sample will recruit approximately 50 patients from Maroondah Hospital and a further 50 from Box Hill Hospital. We will aim to reach a sample size of at least 200 to achieve statistically significant data.

Data Collection, Storage and Analysis

Study data will be collected and managed using REDCap electronic data capture tools hosted on the Eastern Health Data Warehouse Platform[43,44]. REDCap (Research Electronic Data Capture) is a secure, web-based software platform designed to support data capture for research studies, providing 1) an intuitive interface for validated data capture; 2) audit trails for tracking data manipulation and export procedures; 3) automated

export procedures for seamless data downloads to common statistical packages; and 4) procedures for data integration and interoperability with external sources.

We expect to have a non-normal distribution of data, as has been outlined in the study by McCaffrey et al. assessing Australian EQ-5D-5L population norms.[33] Given this, a non-parametric paired test will likely be utilised to evaluate data. Descriptive statistics and analysis of variance will be used to analyse factors associated with the change in HRQoL. All the values will be averaged with a 95% confidence interval. Further details will be evaluated by a statistician assisting with data analysis.

Data may be used for other related studies on perioperative outcome measures. This includes but is not limited to renal function, intraoperative hypotension, brain health, and surgical risk calculation. All information will be de-identified when accessed by other researchers.

Statistical Methods

Descriptive statistics will be used to describe patients' characteristics and outcomes.

Safety Consideration

Adverse events are unlikely with the QoLAHF study, given it is observational and non-interventional. Patients, with their consent, will be interviewed at known timepoints via telephone at their convenience.

Data collected will be stored securely and only accessed by those conducting the study. Once data collection is complete, data will be de-identified before data analysis. No identifiable information will appear in any publications/presentations. Data collected in REDCap will only be accessible via certified Eastern Health accounts and two-factor authentication. Electronic data will be stored on a secure Eastern Health drive accessible to project researchers only and locked by a password. Any physical data/consent forms will be kept in a locked filing cabinet in the Maroondah Anaesthetics Department. All data will be kept for 15 years, after which point it will be destroyed appropriately.

Patients will not be followed up beyond the duration of the study unless further follow-up is warranted and consented to by the patient/proxy on a case-by-case basis. If patients have raised concerns or questions regarding their hospital care or outcomes during the interview, these concerns will be redirected to the relevant treating team (including GP and ED).

Quality Assurance

Data will be collected via a standardised questionnaire as outlined on REDCap. Data will be collected by researchers who will have meetings to standardise answers given by participants and ensure consistency between interviews/telephone calls.

PCIF

As per Person Responsible / Medical Treatment Decision Maker PCIF template

Results

The study results will be submitted for consideration for publication in peer-reviewed journals as well as presentations at the Eastern Health Annual Research Forum, and national and international conferences.

Once data analysis is complete, patients recruited will also be informed about the overall outcome of the project and the impact the knowledge gained will have. They will also be re-informed about the plans for publication of the de-identified findings in medical journals. Lastly, patients will also be allowed to opt-in for any follow-up research outside of this project past the planned 12 months. Should they agree, consent will need to be re-collected for any follow-up research.

Other

Project Management

Principal Researcher

Dr Thomas Callaghan	-	Study Design, Ethics and design of project
	-	Supervision of data collection/collation
	-	Analysis, write-up and submission of presentation/paper

Additional Researchers

Dr Jack Dale	-	Study Design, Ethics and design of project
	-	Data collection/collation and supervision
	-	Analysis, write-up and submission of presentation/paper
Dr Aihua Wu	-	Data collection and collation
	-	Analysis, write-up and submission of presentation/paper
Dr Basel El-Behesy	-	Data collection and collation
	-	Analysis, write-up and submission of presentation/paper

Additional anaesthetics department staff will be involved in the collection and input of data into the REDCap project.

Ethics and Consent

An ethics application will be submitted to Eastern Health Human Ethics Committee as a low-risk project, given the lack of therapeutic intervention and the absence of financial incentives. Consent will be obtained verbally before the commencement of each phone interview; this will be recorded at the beginning of each phone call. Given this study is observational (non-interventional), there will be a lower threshold for capacity than interventional studies. Capacity assessment will take place regardless of MMSE score.

Participants and proxies, regardless whom has provided answers, will be given contact details should they wish to express any concerns about the project or report harm or distress as a result of the project. Counselling services are available by qualified staff that are not members of the research team and can be delivered free of charge.

Funding

No cost will be required. The research will be performed by staff and students voluntarily. Freely available software is to be used. Phone calls will be made by volunteers using their personal phones or hospital phones, and data will be collected using REDCap, which is available to all Eastern Health staff.

Additional paid research personnel may be recruited to facilitate consistent data collection, but this will depend on research grant funds available for this project.

References

1. Australian Institute of Health and Welfare. Osteoporosis. Canberra (AU) 2020 .
2. Australian Institute of Health and Welfare. Use of health services for arthritis and osteoporosis [Internet]. Canberra (AU) 2010 . Available from: https://www.aihw.gov.au/getmedia/da3924b1-aabd-486b-a0c7-e8ec0d44fe5b/11833.pdf.aspx?inline=true
3. Watts JJ, Abimanyi-Ochom J, Sanders KM. Osteoporosis costing all Australians A new burden of disease analysis – 2012 to 2022 [Internet]. Glebe 2022 . Available from: https://healthybonesaustralia.org.au/wp-content/uploads/2020/11/Burden-of-Disease-Analysis-2012-2022.pdf
4. Borgström F, Lekander I, Ivergård M, Ström O, Svedbom A, Alekna V, et al. The International Costs and Utilities Related to Osteoporotic Fractures Study (ICUROS) - Quality of life during the first 4 months after fracture [Internet]. Osteoporos Int [Internet]. Springer; 2013 Mar 10;24(3):811–23. Available from: https://link.springer.com/article/10.1007/s00198-012-2240-2
5. Talevski J, Sanders KM, Vogrin S, Duque G, Beauchamp A, Seeman E, et al. Recovery of quality of life is associated with lower mortality 5-year post-fracture: the Australian arm of the International Costs and Utilities Related to Osteoporotic Fractures Study (AusICUROS) [Internet]. Arch Osteoporos [Internet]. 2021 Dec 15 [cited 2021 Oct 21];16(1):112. Available from: https://doi.org/10.1007/s11657-021-00981-y
6. Caeiro JR, Bartra A, Mesa-Ramos M, Etxebarría Í, Montejo J, Carpintero P, et al. Burden of First Osteoporotic Hip Fracture in Spain: A Prospective, 12-Month, Observational Study [Internet]. Calcif Tissue Int [Internet]. Springer; 2017 Jan 1 [cited 2022 Mar 12];100(1):29. Available from: /pmc/articles/PMC5214753/
7. Marques A, Lourenço, da Silva JAP. The burden of osteoporotic hip fractures in Portugal: costs, health related quality of life and mortality. Osteoporos Int. Springer London; 2015 Nov 1;26(11):2623–30.
8. Ramírez-Pérez E, Clark P, Carlos F, Camacho A, Franco-Marina F. Health-related quality of life after surgery for hip fracture: a multicentric study in Mexican population [Internet]. Medwave [Internet]. Medwave; 2014 [cited 2022 Mar 13];14(05):e5972. Available from: /link.cgi/English/Original/Research/5973
9. Buecking B, Struewer J, Waldermann A, Horstmann K, Schubert N, Balzer-Geldsetzer M, et al. What determines health-related quality of life in hip fracture patients at the end of acute care? - A prospective observational study. Osteoporos Int. Springer-Verlag London Ltd; 2014;25(2):475–84.
10. da Costa JAT, Ribeiro A, Bogas M, Costa L, Varino C, Lucas R, et al. Mortality and functional impairment after hip fracture - a prospective study in a Portuguese population. [Internet]. Acta Reumatol Port [Internet]. Portugal 2009;34(4):618–26. Available from: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=med7&NEWS=N&AN=20852575
11. Lee AYJ, Tan J, Koh J, Fook-Chong SMC, Lo NN, Howe T Sen. Five-year outcome of individuals with hip fracture admitted to a Singapore hospital: quality of life and survival rates after treatment [Internet]. J Am Geriatr Soc [Internet]. J Am Geriatr Soc; 2012 May [cited 2022 Mar 13];60(5):994–6. Available from: https://pubmed.ncbi.nlm.nih.gov/22587868/
12. Ekström W, Miedel R, Ponzer S, Hedström M, Samnegård E, Tidermark J. Quality of life after a stable trochanteric fracture-A prospective cohort study on 148 patients [Internet]. J Orthop Trauma [Internet]. 2009 Jan [cited 2022 May 28];23(1):39–44. Available from: https://journals.lww.com/jorthotrauma/Fulltext/2009/01000/Quality_of_Life_After_a_Stable_Trochanteric.6.aspx
13. Borgström F, Zethraeus N, Johnell O, Lidgren L, Ponzer S, Svensson O, et al. Costs and quality of life associated with osteoporosis-related fractures in Sweden [Internet]. Osteoporos Int [Internet]. Osteoporos Int; 2006 May;17(5):637–50. Available from: https://pubmed.ncbi.nlm.nih.gov/16283064/

14. Avci CC, Saglam N, Saka G, Kurtulmus T, Gulabi D, Bulut G. Is internal fixation of the intertrochanteric fractures reliable option in patients with cognitive dysfunction?. [Internet]. Acta Orthop Belg [Internet]. Belgium 2016;82(1):1–11. Available from: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=med13&NEWS=N&AN=26984648
15. Ciubean AD, Ungur RA, Irsay L, Ciortea VM, Borda IM, Onac I, et al. Health-related quality of life in Romanian postmenopausal women with osteoporosis and fragility fractures [Internet]. Clin Interv Aging [Internet]. Dove Press; 2018 [cited 2022 May 14];13:2465. Available from: /pmc/articles/PMC6284528/
16. Ware JE. SF-36 Health Survey update [Internet]. Spine. Spine (Phila Pa 1976); 2000 p. 3130–9. Available from: https://pubmed.ncbi.nlm.nih.gov/11124729/
17. Boonen S, Autier P, Barette M, Vanderschueren D, Lips P, Haentjens P. Functional outcome and quality of life following hip fracture in elderly women: A prospective controlled study [Internet]. Osteoporos Int [Internet]. Springer; 2004 Feb 7 [cited 2022 May 28];15(2):87–94. Available from: https://link.springer.com/article/10.1007/s00198-003-1515-z
18. Tidermark J, Bergström G, Svensson O, Törnkvist H, Ponzer S. Responsiveness of the EuroQol (EQ 5-D) and the SF-36 in elderly patients with displaced femoral neck fractures [Internet]. Qual Life Res [Internet]. Qual Life Res; 2003 Dec [cited 2022 May 25];12(8):1069–79. Available from: https://pubmed.ncbi.nlm.nih.gov/14651424/
19. Brazier JE, Walters SJ, Nicholl JP, Kohler B. Using the SF-36 and Euroqol on an elderly population [Internet]. Qual Life Res 1996 52 [Internet]. Springer; 1996;5(2):195–204. Available from: https://link.springer.com/article/10.1007/BF00434741
20. Rohde G, Moum T, Haugeberg G. Comparing 15D and SF-6D Performance in fragility wrist and hip fracture patients in a two-year follow-up case-control study. Value Heal. 2012 Dec;15(8):1100–7.
21. Chiu MH, Hwang HF, Lee HD, Chien DK, Chen CY, Lin MR. Effect of Fracture Type on Health-Related Quality of Life Among Older Women in Taiwan. Arch Phys Med Rehabil. W.B. Saunders; 2012 Mar 1;93(3):512–9.
22. Tarride JE, Burke N, Leslie WD, Morin SN, Adachi JD, Papaioannou A, et al. Loss of health related quality of life following low-trauma fractures in the elderly. BMC Geriatr. BioMed Central Ltd.; 2016;16(1).
23. Mahoney F, Barthel D. Functional evaluation: the Barthel index. [Internet]. Md State Med J [Internet]. 1965 Feb;14:61–5. Available from: http://www.ncbi.nlm.nih.gov/pubmed/14258950
24. Katz S, Ford AB, Moskowitz RW, Jackson BA, Jaffe MW. Studies of Illness in the Aged: The Index of ADL: A Standardized Measure of Biological and Psychosocial Function [Internet]. JAMA [Internet]. American Medical Association; 1963 Sep 21;185(12):914–9. Available from: https://jamanetwork.com/journals/jama/fullarticle/666768
25. da Casa C, Pablos-Hernandez C, Gonzalez-Ramirez A, Julian-Enriquez JM, Blanco JF. Geriatric scores can predict long-term survival rate after hip fracture surgery. [Internet]. BMC Geriatr [Internet]. England 2019;19(1):205. Available from: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=med16&NEWS=N&AN=31370806
26. Charlson ME, Pompei P, Ales KL, MacKenzie CR. A new method of classifying prognostic comorbidity in longitudinal studies: development and validation [Internet]. J Chronic Dis [Internet]. J Chronic Dis; 1987 [cited 2022 May 28];40(5):373–83. Available from: https://pubmed.ncbi.nlm.nih.gov/3558716/
27. Creavin ST, Wisniewski S, Noel-Storr AH, Trevelyan CM, Hampton T, Rayment D, et al. Mini-Mental State Examination (MMSE) for the detection of dementia in clinically unevaluated people aged 65 and over in community and primary care populations [Internet]. Cochrane Database Syst Rev [Internet]. John Wiley & Sons, Ltd; 2016 Jan 13 [cited 2022 Mar 16];(1). Available from: https://doi.wiley.com/10.1002/14651858.CD011145.pub2
28. Arevalo-Rodriguez I, Smailagic N, Roqué-Figuls M, Ciapponi A, Sanchez-Perez E, Giannakou A, et al. Mini-Mental State Examination (MMSE) for the early detection of dementia in people with mild cognitive impairment (MCI) [Internet]. Cochrane Database Syst Rev [Internet]. John Wiley & Sons, Ltd;

2021 Jul 27 [cited 2022 Mar 16];2021(7). Available from: http://doi.wiley.com/10.1002/14651858.CD010783.pub3
29. Tombaugh TN, McIntyre NJ. The Mini-Mental State Examination: A Comprehensive Review [Internet]. J Am Geriatr Soc [Internet]. 1992 Sep;40(9):922–35. Available from: https://onlinelibrary.wiley.com/doi/10.1111/j.1532-5415.1992.tb01992.x
30. von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies [Internet]. J Clin Epidemiol [Internet]. Elsevier; 2008 Apr 1;61(4):344–9. Available from: http://www.jclinepi.com/article/S0895435607004362/fulltext
31. Janssen MF, Pickard AS, Golicki D, Gudex C, Niewada M, Scalone L, et al. Measurement properties of the EQ-5D-5L compared to the EQ-5D-3L across eight patient groups: a multi-country study. Qual Life Res. 2013 Sep;22(7):1717–27.
32. Herdman M, Gudex C, Lloyd A, Janssen M, Kind P, Parkin D, et al. Development and preliminary testing of the new five-level version of EQ-5D (EQ-5D-5L). Qual Life Res. 2011 Dec;20(10):1727–36.
33. McCaffrey N, Kaambwa B, Currow DC, Ratcliffe J. Health-related quality of life measured using the EQ-5D–5L: South Australian population norms [Internet]. Health Qual Life Outcomes [Internet]. BioMed Central; 2016 Sep 20 [cited 2022 Mar 12];14(1). Available from: /pmc/articles/PMC5028927/
34. Katz PP, Association of Rheumatology Health Professionals Outcomes Measures Task Force. Measures of adult general functional status: The Barthel Index, Katz Index of Activities of Daily Living, Health Assessment Questionnaire (HAQ), MACTAR Patient Preference Disability Questionnaire, and Modified Health Assessment Questionnaire (MHAQ) [Internet]. Arthritis Rheum [Internet]. 2003 Oct 15;49(S5):S15–27. Available from: https://onlinelibrary.wiley.com/doi/10.1002/art.11415
35. Mayoral AP, Ibarz E, Gracia L, Mateo J, Herrera A. The use of Barthel index for the assessment of the functional recovery after osteoporotic hip fracture: One year follow-up [Internet]. PLoS One [Internet]. Public Library of Science; 2019 Feb 1;14(2). Available from: /pmc/articles/PMC6366714/
36. Myles PS, Shulman MA, Heritier S, Wallace S, McIlroy DR, McCluskey S, et al. Validation of days at home as an outcome measure after surgery: a prospective cohort study in Australia [Internet]. BMJ Open [Internet]. BMJ Publishing Group; 2017 Aug 1 [cited 2022 May 25];7(8). Available from: /pmc/articles/PMC5629653/
37. Bell M, Eriksson LI, Svensson T, Hallqvist L, Granath F, Reilly J, et al. Days at Home after Surgery: An Integrated and Efficient Outcome Measure for Clinical Trials and Quality Assurance [Internet]. EClinicalMedicine [Internet]. Elsevier; 2019 May 1 [cited 2022 May 25];11:18. Available from: /pmc/articles/PMC6610780/
38. Jerath A, Austin PC, Wijeysundera DN. Days Alive and Out of HospitalValidation of a Patient-centered Outcome for Perioperative Medicine [Internet]. Anesthesiology [Internet]. American Society of Anesthesiologists; 2019 Jul 1;131(1):84–93. Available from: https://pubs.asahq.org/anesthesiology/article/131/1/84/18061/Days-Alive-and-Out-of-HospitalValidation-of-a
39. Ariti CA, Cleland JGF, Pocock SJ, Pfeffer MA, Swedberg K, Granger CB, et al. Days alive and out of hospital and the patient journey in patients with heart failure: Insights from the Candesartan in Heart failure: Assessment of Reduction in Mortality and morbidity (CHARM) program. Am Heart J. Mosby; 2011 Nov 1;162(5):900–6.
40. Jørgensen CC, Petersen PB, Kehlet H, Madsen F, Hansen TB, Husted H, et al. Days alive and out of hospital after fast-track total hip and knee arthroplasty: an observational cohort study in 16 137 patients [Internet]. Br J Anaesth [Internet]. Elsevier Ltd; 2019 Nov 1;123(5):671–8. Available from: http://www.bjanaesthesia.org.uk/article/S0007091219305999/fulltext
41. Roccaforte WH, Burke WJ, Bayer BL, Wengel SP. Validation of a Telephone Version of the Mini-Mental State Examination [Internet]. J Am Geriatr Soc [Internet]. John Wiley & Sons, Ltd; 1992 Jul 1 [cited 2022 Jul 3];40(7):697–702. Available from: https://onlinelibrary.wiley.com/doi/full/10.1111/j.1532-

5415.1992.tb01962.x
42. Lingard EA, Wright EA, Sledge CB. Pitfalls of using patient recall to derive preoperative status in outcome studies of total knee arthroplasty [Internet]. J Bone Joint Surg Am [Internet]. J Bone Joint Surg Am; 2001 [cited 2022 May 28];83(8):1149–56. Available from: https://pubmed.ncbi.nlm.nih.gov/11507122/
43. Harris PA, Taylor R, Minor BL, Elliott V, Fernandez M, O'Neal L, et al. The REDCap consortium: Building an international community of software platform partners. J Biomed Inform. Academic Press; 2019 Jul;95:103208.
44. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)—A metadata-driven methodology and workflow process for providing translational research informatics support. J Biomed Inform. Academic Press; 2009 Apr;42(2):377–81.

Appendix 1 – EuroQol EQ-5D-5L

Under each heading, please tick the ONE box that best describes your health TODAY.

MOBILITY
- I have no problems in walking about ❑
- I have slight problems in walking about ❑
- I have moderate problems in walking about ❑
- I have severe problems in walking about ❑
- I am unable to walk about ❑

SELF-CARE
- I have no problems washing or dressing myself ❑
- I have slight problems washing or dressing myself ❑
- I have moderate problems washing or dressing myself ❑
- I have severe problems washing or dressing myself ❑
- I am unable to wash or dress myself ❑

USUAL ACTIVITIES *(e.g. work, study, housework, family or leisure activities)*
- I have no problems doing my usual activities ❑
- I have slight problems doing my usual activities ❑
- I have moderate problems doing my usual activities ❑
- I have severe problems doing my usual activities ❑
- I am unable to do my usual activities ❑

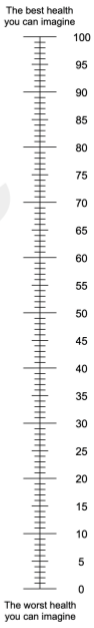
PAIN / DISCOMFORT
- I have no pain or discomfort ❑
- I have slight pain or discomfort ❑
- I have moderate pain or discomfort ❑
- I have severe pain or discomfort ❑
- I have extreme pain or discomfort ❑

ANXIETY / DEPRESSION
- I am not anxious or depressed ❑
- I am slightly anxious or depressed ❑
- I am moderately anxious or depressed ❑
- I am severely anxious or depressed ❑
- I am extremely anxious or depressed ❑

2

- We would like to know how good or bad your health is TODAY.
- This scale is numbered from 0 to 100.
- 100 means the best health you can imagine.
  0 means the worst health you can imagine.
- Please mark an X on the scale to indicate how your health is TODAY.
- Now, write the number you marked on the scale in the box below.

YOUR HEALTH TODAY = ☐



3

Paper version

Appendix 2 – Barthel Index

THE BARTHEL INDEX

Patient Name: _____
Rater Name: _____
Date: _____

Activity	Score
FEEDING 0 = unable 5 = needs help cutting, spreading butter, etc., or requires modified diet 10 = independent	____
BATHING 0 = dependent 5 = independent (or in shower)	____
GROOMING 0 = needs to help with personal care 5 = independent face/hair/teeth/shaving (implements provided)	____
DRESSING 0 = dependent 5 = needs help but can do about half unaided 10 = independent (including buttons, zips, laces, etc.)	____
BOWELS 0 = incontinent (or needs to be given enemas) 5 = occasional accident 10 = continent	____
BLADDER 0 = incontinent, or catheterized and unable to manage alone 5 = occasional accident 10 = continent	____
TOILET USE 0 = dependent 5 = needs some help, but can do something alone 10 = independent (on and off, dressing, wiping)	____
TRANSFERS (BED TO CHAIR AND BACK) 0 = unable, no sitting balance 5 = major help (one or two people, physical), can sit 10 = minor help (verbal or physical) 15 = independent	____
MOBILITY (ON LEVEL SURFACES) 0 = immobile or < 50 yards 5 = wheelchair independent, including corners, > 50 yards 10 = walks with help of one person (verbal or physical) > 50 yards 15 = independent (but may use any aid; for example, stick) > 50 yards	____
STAIRS 0 = unable 5 = needs help (verbal, physical, carrying aid) 10 = independent	____
TOTAL (0–100):	____

Provided by the Internet Stroke Center — www.strokecenter.org

The Barthel ADL Index: Guidelines

1. The index should be used as a record of what a patient does, not as a record of what a patient could do.
2. The main aim is to establish degree of independence from any help, physical or verbal, however minor and for whatever reason.
3. The need for supervision renders the patient not independent.
4. A patient's performance should be established using the best available evidence. Asking the patient, friends/relatives and nurses are the usual sources, but direct observation and common sense are also important. However direct testing is not needed.
5. Usually the patient's performance over the preceding 24-48 hours is important, but occasionally longer periods will be relevant.
6. Middle categories imply that the patient supplies over 50 per cent of the effort.
7. Use of aids to be independent is allowed.

References

Mahoney FI, Barthel D. "Functional evaluation: the Barthel Index."
Maryland State Medical Journal 1965;14:56-61. Used with permission.

Loewen SC, Anderson BA. "Predictors of stroke outcome using objective measurement scales."
***Stroke*. 1990;21:78-81.**

Gresham GE, Phillips TF, Labi ML. "ADL status in stroke: relative merits of three standard indexes."
***Arch Phys Med Rehabil*. 1980;61:355-358.**

Collin C, Wade DT, Davies S, Horne V. "The Barthel ADL Index: a reliability study."
***Int Disability Study*.1988;10:61-63.**

Copyright Information

Provided by the Internet Stroke Center — www.strokecenter.org

Appendix 3 – Standardised Mini-Mental State Examination Form

easternhealth

STANDARDISED MINI-MENTAL STATE EXAMINATION FORM

Page 4 of 4

UR Number:
Surname:
Given Name:
Date of Birth: ___/___/___ Sex: M / F
(Affix Hospital I.D. Label if Available)

OBSERVATIONS: (Please circle)

1. CONSCIOUS STATE: Normal | Impaired - specify

2. COMMAND OF ENGLISH: Fluent | Non-fluent | Interpreter Used

3. PHYSICAL OR SENSORY IMPAIRMENT:

Hearing: Normal+/- Aid | Deaf
Vision: Normal+/- Aid | Impaired
Physical: (note any)
Speech: Normal | Impaired - specify

4. THE PATIENT'S APPROACH TO COMPLETING THE SMMSE WAS: Reluctant | Tolerant | Enthusiastic

5. IN YOUR OPINION MIGHT THE PATIENT'S PERFORMANCE HAVE BEEN SIGNIFICANTLY AFFECTED BY THE PRESENCE OF ABNORMAL MOOD OR PSYCHOSIS?

Yes | No | Unsure

NOTES:

STANDARDISED MINI-MENTAL STATE EXAMINATION FORM

easternhealth

STANDARDISED MINI-MENTAL STATE EXAMINATION FORM

Page 1 of 4

UR Number:
Surname:
Given Name:
Date of Birth: ___/___/___ Sex: M / F
(Affix Hospital I.D. Label if Available)

I am going to ask you some questions and give you some problems to solve. Please try to answer them as best as you can.

	SCORE	MAX
1. (Allow 10 seconds for each reply)		
a) What year is this? (accept exact answer only)	( )	1
b) What season is this? (during the last week of the old season or first week of a new season, accept either season)	( )	1
c) What month of the year is this? (on the first day of the month, or last day of the previous month, accept either)	( )	1
d) What is today's date? (accept previous or next date, e.g. on the 7th accept 6th or 8th)	( )	1
e) What day of the week is this? (accept exact answer only)	( )	1
2. (Allow 10 seconds for each reply)		
a) What country are we in? (accept exact answer only)	( )	1
b) What province/state/county are we in? (accept exact answer only)	( )	1
c) What city/town are we in? (accept exact answer only)	( )	1
d) *(in clinic)* **What is the name of this hospital/building?** (accept exact name of hospital or institution only)	( )	1
(in home) **What is the street address of this house?** (accept street name and house number or equivalent in rural areas)		
e) *(in clinic)* **What floor of the building are we on?** (accept exact answer only)	( )	1
(in home) **What room are we in?** (accept exact answer only)		

3. I am going to name three objects. After I have said all three objects, I want you to repeat them. Remember what they are because I am going to ask you to name them again in a few minutes.
(Say them slowly, at approximately one second intervals)

BALL CAR MAN

For repeated use:
BELL JAR FAN
BILL TAR CAN
BULL WAR PAN

Please repeat the three items for me ( ) 3
(score 1 point for each correct reply on the first attempt)
(allow 20 seconds for reply, if subject did not repeat all three, repeat until they are learned or up to a maximum of five times)

NAME OF CLINICIAN: **DISCIPLINE:** **SIGNATURE:**

DATE:

Allanby Press EH362600 MR0306 09/17

STANDARDISED MINI-MENTAL STATE EXAMINATION FORM EH 362600

easternhealth

STANDARDISED MINI-MENTAL STATE EXAMINATION FORM

Page 2 of 4

UR Number:
Surname:
Given Name:
Date of Birth: ___/___/___ Sex: M / F
(Affix Hospital I.D. Label if Available)

(Allow 10 seconds for each reply)	SCORE	MAX
4. Spell the word "WORLD" (you may help subject to spell world correctly) Say **"Now spell it backwards please"** (if the subject cannot spell "world" even with assistance - score 0)	( )	5
5. Now what were the three objects that I asked you to remember? **BALL CAR MAN** (score one point for correct response regardless of order)	( )	3
6. Show wristwatch. Ask **"What is this called?"'** (score 1 point for correct response) Accept "wristwatch" or "Watch". Do not accept "Clock", "Time" etc. (allow 10 seconds)	( )	1
7. Show pencil. Ask, **"What is this called?"** (score 1 point for correct response, accept pencil only - score 0 for pen)	( )	1
8. I'd like you to repeat a phrase after me: "No ifs, ands or buts" (Allow 10 seconds for response. Score 1 point for correct repetition) Must be exact e.g. no ifs or buts - score 0	( )	1
9. Read the words on this page and then do what it says. (take page 4, fold page in half, show subject half with "CLOSE YOUR EYES" on it) CLOSE YOUR EYES (if subject just reads the words and does not then close eyes - may repeat "read the words on this page and then do what it says" to a maximum of 3 times. Allow 10 seconds. Score one point only if the subject closes eyes. Subject does not have to read aloud)	( )	1
10. Ask if the subject is right or left-handed. Alternate right/left hand in statement e.g. if the subject is Right handed say "Take a piece of paper in your left hand..." Take a piece of paper - hold it up in front of subject and say the following: **"Take this paper in your right/left hand, fold the paper in half once with both hands and put the paper down on the floor"** Takes paper in the correct hand ( ) 1 Folds it in half ( ) 1 Puts it on the floor ( ) 1 (allow 30 seconds. Score 1 point for each instruction correctly executed)	( )	3
11. (Hand subject a pencil and paper) - see page 3 **Write any complete sentence on that piece of paper** (allow 30 seconds. Score 1 Point. The sentence should make sense. Ignore spelling errors)	( )	1
12. Place page 3, folded in half with design showing, a pencil and paper in front of subject. **Copy this design please** Allow multiple tries until subject is finished and hands it back. Score 1 point for correctly copied diagram. The subject must have drawn a 4 sided figure between the two 5 sided figures). (Maximum Time - 1 minute)	( )	1
TOTAL TEST SCORE	( )	30

STANDARDISED MINI-MENTAL STATE EXAMINATION FORM

easternhealth

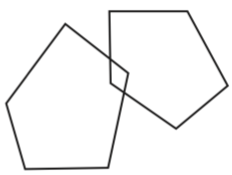
STANDARDISED MINI-MENTAL STATE EXAMINATION FORM

Page 3 of 4

UR Number:
Surname:
Given Name:
Date of Birth: ___/___/___ Sex: M / F
(Affix Hospital I.D. Label if Available)

CLOSE YOUR EYES

Write a sentence:



DATE: NAME OF CLINICIAN: SIGNATURE:

STANDARDISED MINI-MENTAL STATE EXAMINATION FORM EH 362600

Appendix 4 – ACS NSQIP Surgical Risk Calculator